

DRY CREEK

A. Water Quality Data

1. 1979 August to October Grab Sampling in Dry Creek. Water quality samples were collected from Dry Creek, upstream of the Roseville Wastewater Treatment Plant on four dates during the period August to October 1979. This survey reported (Table 1) the following results. **Source: DEIR Northeast Roseville Specific Plan 1986.**

Table 1. Water quality data from August to October 1979 grab sampling in Dry Creek, upstream of the Roseville Wastewater Treatment Plant.

Parameter Sampled	8/29/79	9/20/79	10/3/79	10/16/79
pH	7.4	--	7.0	--
Water Temperature (°C)	21.0	20.0	18.0	19.0
Time Sampled	0625	1025	1015	1230
Dissolved Oxygen (mg/l)	7.2	9.2	8.7	8.5
Nitrate (mg/l as N)	0.06	--	0.02	--
Nitrite (mg/l as N)	<0.01	--	<0.01	--
Total NH ₃ (mg/l as N)	0.13	--	0.30	--
TKN (mg/l as N)	0.55	--	0.61	--
Total Phosphate (mg/l as P)	--	--	0.16	--
Orthophosphate (mg/l as P)	--	--	0.16	--

Source: DEIR Northeast Roseville Specific Plan 1986.

2. Summary of 1989 and 1990 Water Quality Sampling Upstream of the City of Roseville Wastewater Treatment Plant Outfall: This data (Table 2) appears to be a summary of the monitoring requirements for the City of Roseville's NPDES permit for this facility. The data parameters measured are typical of NPDES monitoring requirements in this area. If this assumption is true, then additional data for all of the years monitoring has been required by the NPDES permit should be available. This type of data usually involves a single event sample collected on selected days during the year. The number of samples collected varies by constituent and between years. These data are of limited use in analyzing general conditions in the watershed. For the data in Table 2, sample sizes range from 52-79 and 44-124, depending on the constituent, for 1989 and 1990, respectively. **Source: City of Roseville, Roseville Regional Wastewater Treatment Service Area Master Plan DEIR, 1996.**

Table 2. Maximum, minimum, and mean values for selected water quality parameters from Dry Creek, upstream of the wastewater treatment plant outfall, during 1989 and 1990.

Year	Stream Flow (cfs)	Dissolved Oxygen (mg/l)	pH	Water Temp. (°C)	Turbidity (NTU)	Un-ionized Ammonia (mg/l)
1989						
Maximum	387.0	13.2	7.9	17.9	48.0	0.028
Mean	43.9	9.6	7.4	10.8	5.6	0.003
Minimum	17.0	7.0	6.7	3.5	1.2	0.000
1990						
Maximum	235.0	12.5	7.9	28.5	28.0	0.000
Mean	46.9	9.1	7.4	14.9	6.6	0.001
Minimum	3.0	4.8	6.5	3.4	1.3	0.000

Source: City of Roseville; Roseville Regional Wastewater Treatment Service Area Master Plan DEIR, 1996.

3. Dry Creek Conservancy and Central Valley Regional Water Quality Control Board Monitoring Data 2000-2003: The DCC and CVRWQCB members and staff have conducted a variety of monitoring programs and single-time event monitoring at various locations in the Dry Creek Watershed. The data presented here represents only that data collected on the mainstem of Dry Creek and does not include any tributary streams. Only selected parameters, generally more important to anadromous fish, have been analyzed and results presented below.

One of the parameters of concern is the seasonal and often rapid change in pH at various stations. This unexplained pattern has been observed in other watersheds as well. Two examples of rapid and significant fluctuation in measured pH are shown on Figures 1 and 2 to illustrate the situation. Figure 1 shows monthly data from samples at Atkinson Street in Roseville. Notice the magnitude of changes over relatively short periods of time. Figure 2 shows a composite graph for four locations in Dry Creek, including the Atkinson Street site. The same pattern appears.

Figure 1. Monthly pH data at Atkinson Street in Roseville during 2001. Note the magnitude of fluctuations in monthly time increments.

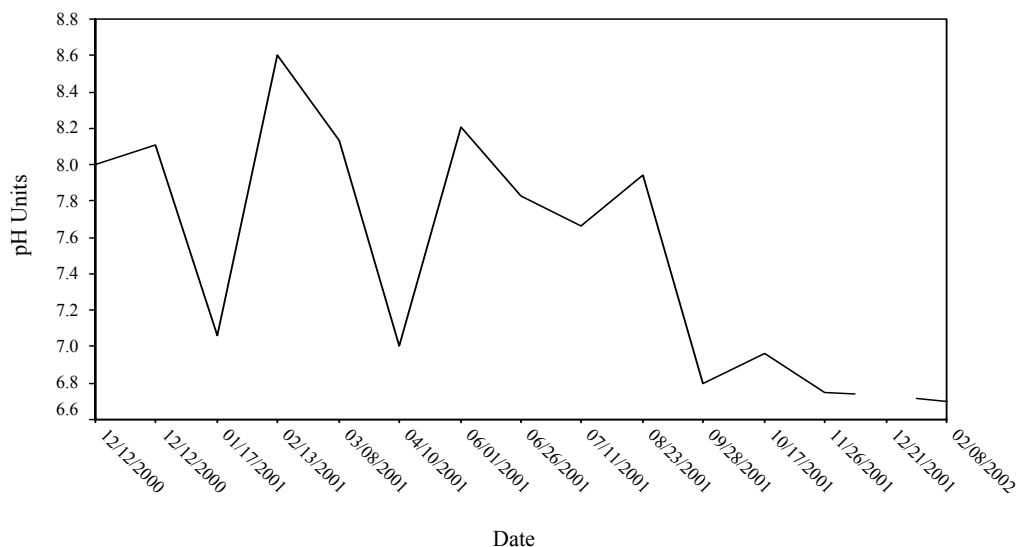
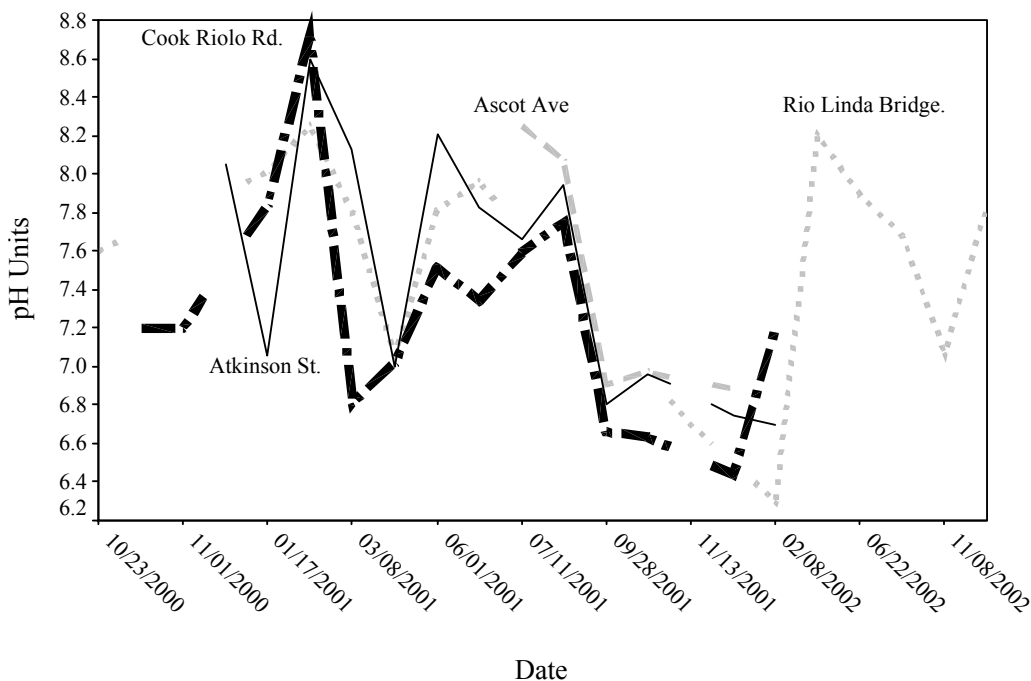


Figure 2. Monthly and quarterly pH values from four sites in the Dry Creek mainstem within and downstream of the City of Roseville. Note the magnitude and rate at which relatively large changes are occurring.



Other water quality parameters of concern include nitrate and orthophosphate. Figure 3 displays data from the Rio Linda Bridge area and shows extremely high levels of both constituents and a nutrient ratio that is out of balance. Normally a ratio of nitrate to orthophosphate of 10:1 is desirable in anadromous fish streams, with nitrate levels not exceeding 1.0 mg/l. Figure 4 displays data from sites in Royer and Saugstedt parks in the City of Roseville and shows high concentrations and an out-of-balance condition.

Figure 3. Nitrate and orthophosphate data from the Rio Linda Bridge area of Dry Creek. Note the high concentrations of each constituent and the ratio between the two concentrations.

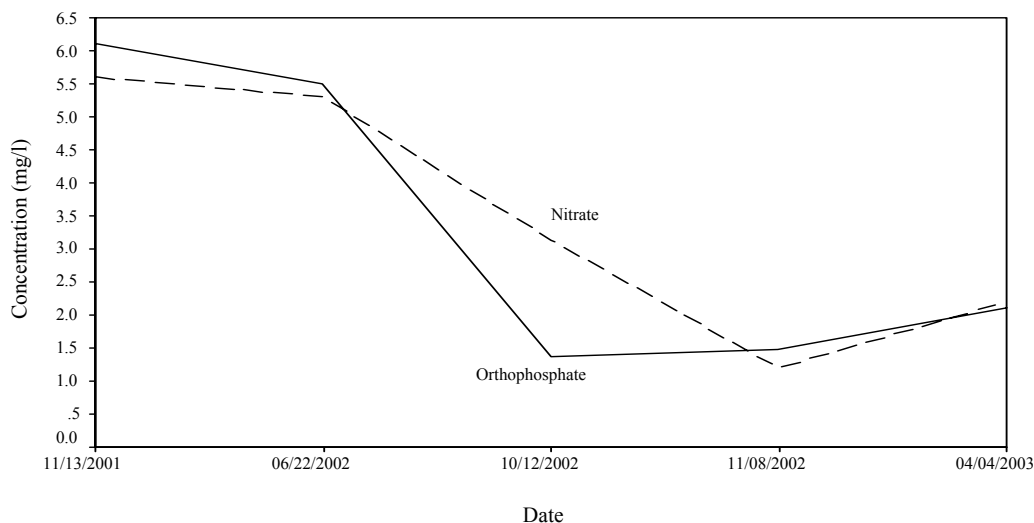
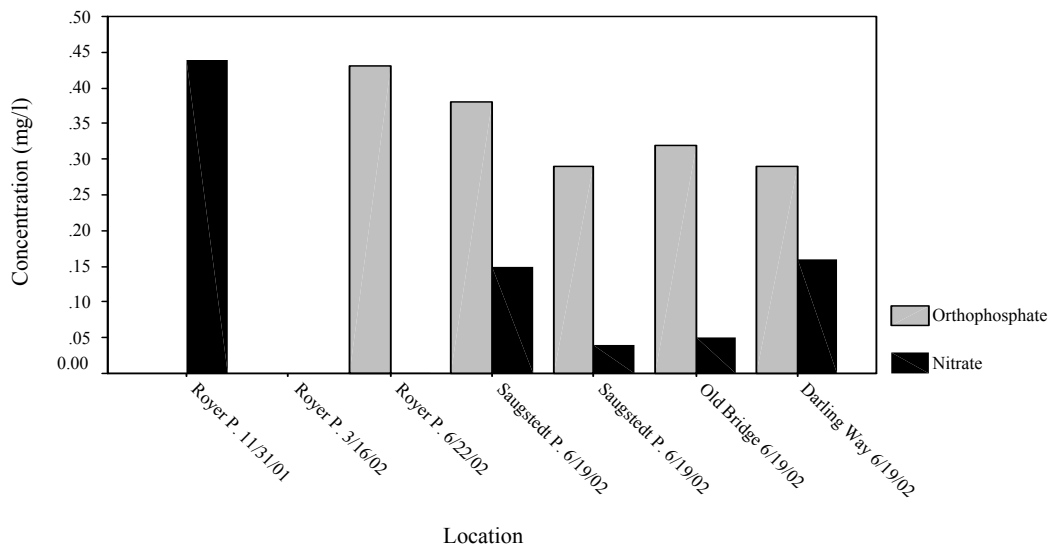


Figure 4. Nitrate (3 dates) and orthophosphate (2 dates) data at Royer Park in Roseville and data from four locations between Darling Way and Saugstedt Park on the same date (6/19/02). Note the relatively low concentrations of nitrate, but the ratio between nitrate and orthophosphate is out of balance. This graph shows that additions of nitrate to the system could cause additional plant growth, with orthophosphate not limiting.



It is probable that additional data are available for other locations in the Dry Creek Watershed, downstream of the confluences with Antelope Creek and both Secret and Miners ravines. However, I have focused on the data that characterize the mainstem of Dry Creek where anadromous fish use probably is concentrated. I have not attempted to collect data for the Linda/Cirby Creek watersheds since they are outside the area under consideration for the HCP. Also, I assumed that Dry Creek begins at the confluence of Secret Ravine and Miners Ravine. Different maps describe the reach between the confluence of Cirby Creek, near Riverside Drive, and upstream to the confluence of Antelope Creek and/or Secret/Miners differently.

In addition to the pH and nutrient data presented above, information on heavy metals has been collected at two locations and dates in the mainstem of Dry Creek. Table 3 displays the California Toxics Rule water quality standards for selected metals. Table 4 displays the data from Dry Creek, which shows that all samples for copper exceeded the water quality standards (note: the standards are for a hardness of 50 mg/l, while the actual hardness fluctuates between about 40-100 mg/l). Two of the three zinc concentrations exceeded the standards. In addition to these metals, one sample from Royer Park contained a concentration of 0.028 mg/l of vanadium, which has no published standard and one sample from the Rio Linda Bridge contained 0.012 mg/l of chromium, but no valence was reported, thus it is impossible to compare this concentration to published standards. **Sources: Central Valley Regional Water Quality Control Board; Dry Creek Conservancy, unpublished data.**

Table 3. California Toxics Rule water quality standards for selected metals, based on a hardness of 50 mg/l as CaCO₃.

Metal	Maximum Concentration (Acute) (mg/L)	Continuous Concentration (Chronic) (mg/L)
Barium	No standard	No standard
Cadmium	0.002	0.0013
Copper	0.007	0.005
Zinc	0.067	0.066

Source: California Toxics Rule (water quality objectives)

Table 4. Metal concentration data from two locations in the Dry Creek Watershed. This data shows that copper and zinc concentrations exceed the California Toxics Rules standards calculated for a hardness of 50 mg/l as CaCO₃.

Stream	Location	Date	Barium mg/l	Copper mg/l*	Zinc mg/l	Notes
Dry Creek	Royer Park	11/13/01	0.160	0.024	0.100	Hardness ≈ 50-100 mg/L
Dry Creek	Rio Linda Bridge	11/13/01	---	0.006	0.046	Hardness ≈ 60 mg/L
Dry Creek	Rio Linda Bridge	11/08/01	---	0.015	0.067	Hardness ≈ 60-100 mg/L

* Values in bold exceed California Toxics Rule objectives for aquatic life at a hardness of 50 mg/L. Sources: Central Valley Regional Water Quality Control Board; Dry Creek Conservancy, unpublished data.

B. Water Temperature Data

Water temperature data for Dry Creek is limited to hourly recordings at two stations (Darling Way and Riverside Drive), and a single station, with recordings every two hours, just downstream of the confluence of Secret and Miners Ravine. CDFG Biologist Rob Titus has conducted monitoring at the Secret/Miners ravines confluence in conjunction with stream monitoring surveys. Only one year's data is currently available for this site, but additional data will become available in mid-December 2003. The temperature monitoring program at Darling Way and Riverside Drive includes seven other stations in the Cirby and Linda Creek watersheds and has not been included here. Data was obtained from Garcia and Associates, which is conducting the study for the City of Roseville. Data has been collected since 1998, but only the data presented in the figures below were available electronically. Since daily maximum, minimum, and/or mean temperatures individually are of little value, I have chosen to plot all data points. Therefore, I have split the year into time periods that roughly correspond to:

Fall-early winter: September through December; primary fall-run chinook salmon spawning period is November-December.

Winter-spring: January through April; fall-run chinook salmon incubation and rearing and steelhead spawning, incubation, and rearing.

Late spring-summer: May to September; summer rearing for steelhead juveniles.

Data plots for these time periods are presented below to allow the reader to assess the potential of Dry Creek to support chinook salmon and/or steelhead trout spawning and rearing. A variety of localized data and literature was reviewed, in order to gain a generalized understanding of the temperature effects on various life history stages for both chinook salmon and steelhead trout. There is fairly substantial variation in temperature effects noted for most life history stages. However, both chinook salmon and steelhead have an adaptable physiology and ability to seek thermal refuges, which allows them to tolerate and/or avoid lethal temperatures. Some of the literature sources cite criteria from others and some of the data is based on fish captures with water temperature taken concurrently. Two tables with data and reference are included in Appendix A of this report. Based on this review, the following criteria have been used to indicate what life history stages a particular stream may support at a given time:

<u>Chinook Salmon</u>	<u>°C</u>	<u>Steelhead Trout</u>	<u>°C</u>
Egg and fry development	14.4 (58 °F)	Egg and fry development	14.4 (58 °F)
Juvenile rearing	21.1 (70 °F)	Juvenile rearing	22.2 (72 °F)
Adult migration	21.7 (71 °F)	Adult migration and holding	22.2 (72 °F)

Reference lines for 14.4 °C and 22.2 °C are provided on Figures 5-16 to represent temperatures suitable for salmonid spawning migration, egg and fry development, and juvenile rearing.

1. Water Temperature Monitoring at the Confluence of Secret and Miners Ravines: Water temperatures were recorded at two-hour intervals. Data for the period July 30, 2002 to August 27, 2003 are presented in Figures 5-8 below. Additional data will be made available to Placer County when it becomes available. **Source: California Department of Fish and Game Biologist Rob Titus, unpublished data.**

Figure 5. Water temperature time series for Dry Creek at the confluence of Secret and Miners ravines, July 30 through August 31, 2002. Temperatures are suitable for juvenile rearing.

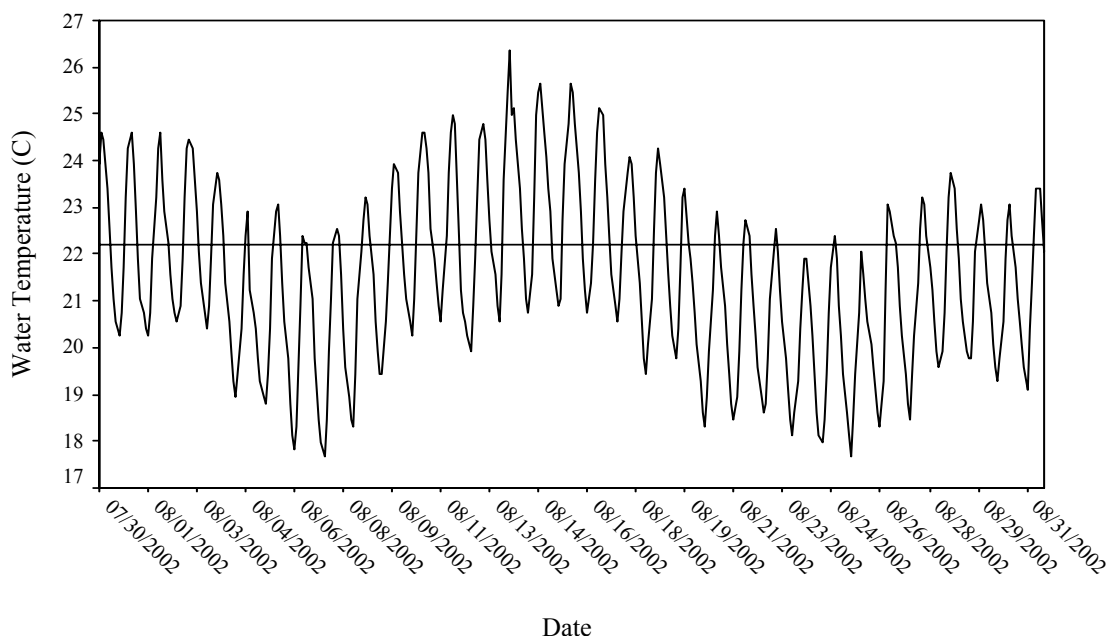


Figure 6. Water temperature time series, Dry Creek, confluence of Secret and Miners ravines, September 1 through December 31, 2002. Temperatures are suitable for juvenile rearing and adult spawning.

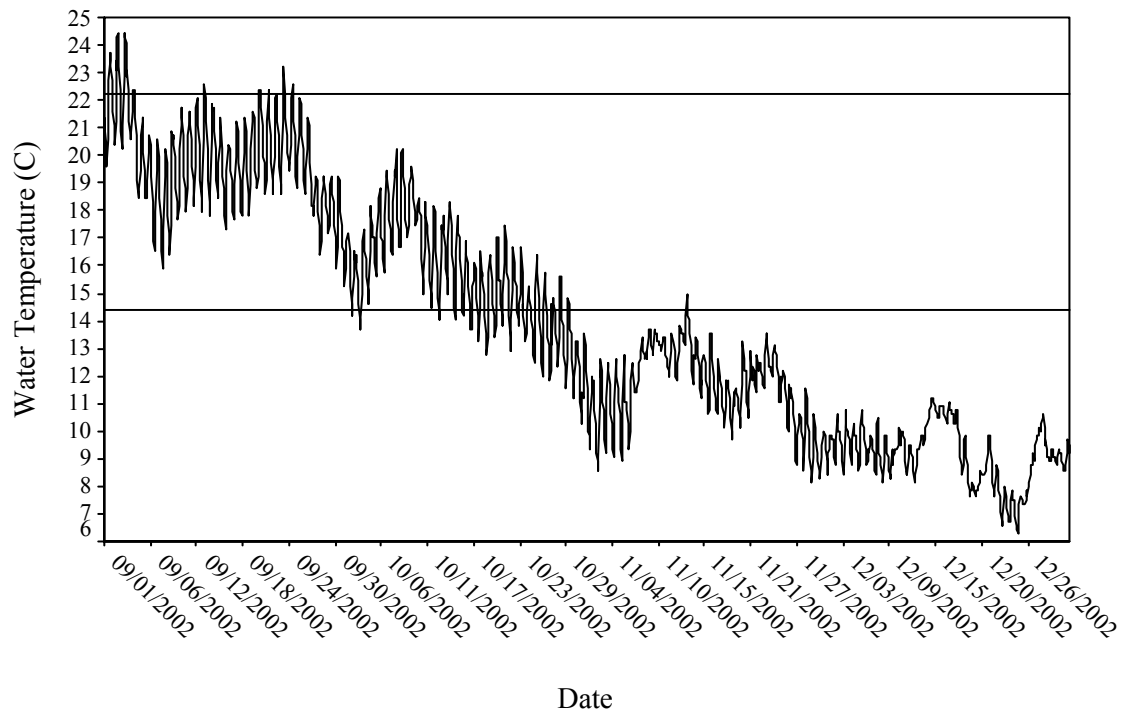


Figure 7. Water temperature time series, Dry Creek, confluence of Secret and Miners ravines, January 1 through April 30, 2003. Temperatures are suitable for juvenile rearing and adult spawning.

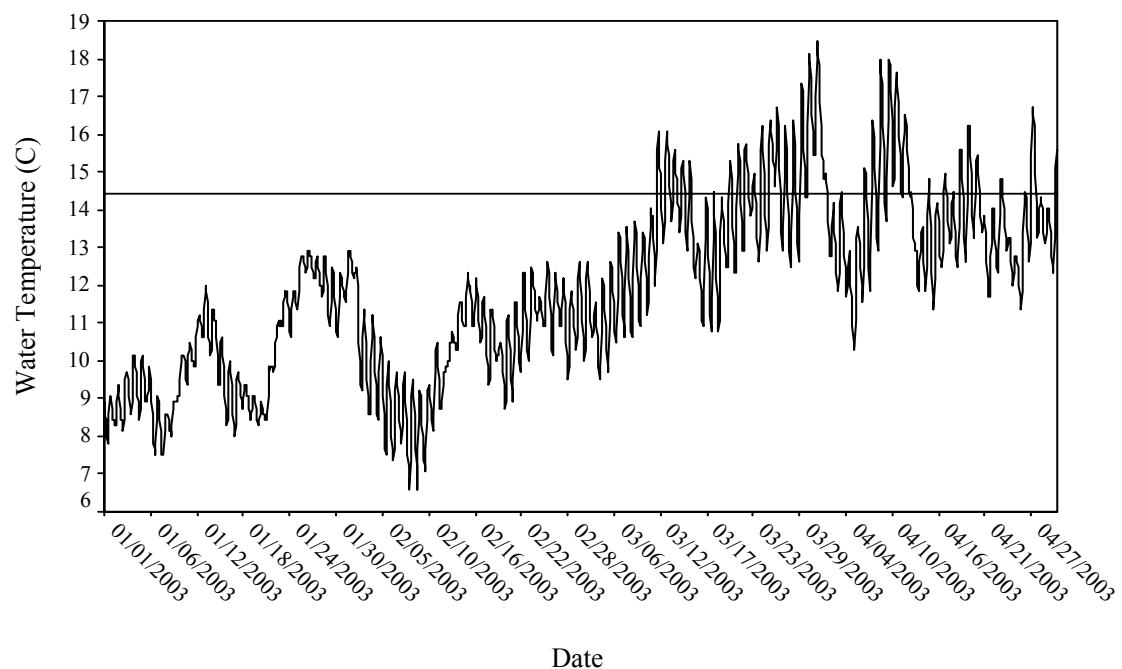
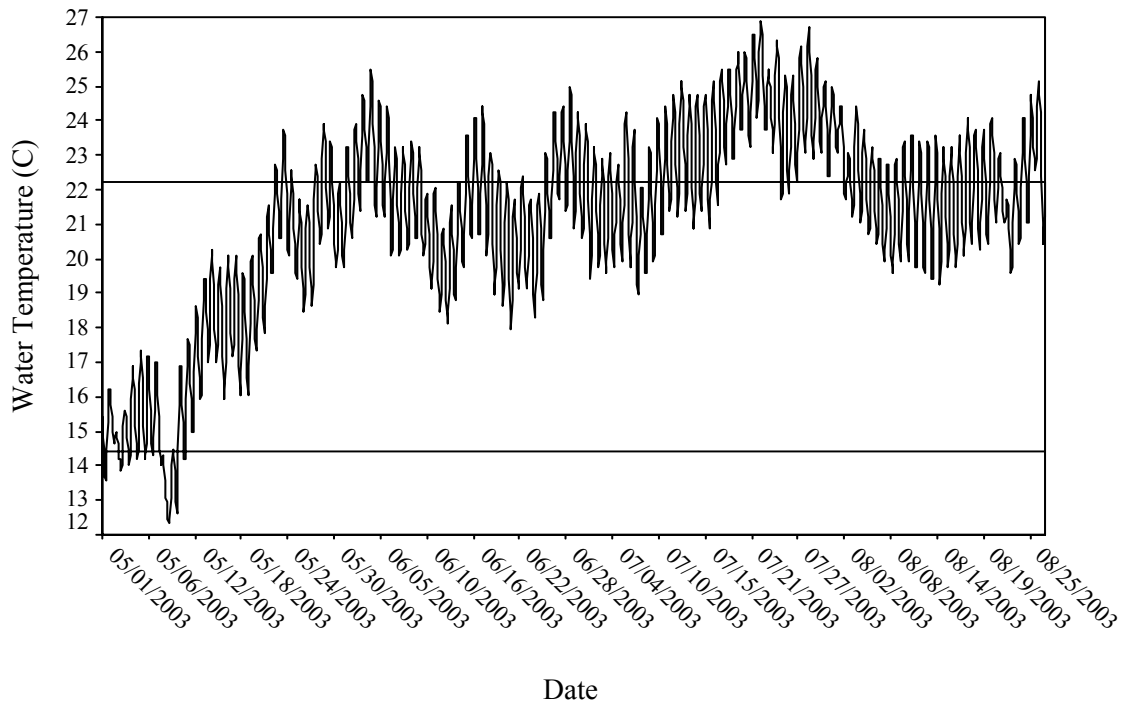


Figure 8. Water temperature time series for Dry Creek at the confluence of Secret and Miners ravines, during the period May 1 through August 27, 2003. Temperatures are suitable for juvenile rearing.



2. Water Temperature Monitoring June 2001 through June 2002 at the Darling Way and Riverside Drive Stations: Water temperature is recorded hourly at these two stations (Figures 9-16) as part of a larger monitoring effort by the City of Roseville. Only the data presented below was available electronically for this report. Additional data is available.
Source: City of Roseville (Garcia and Associates) data.

Figure 9. Water temperature time series for Dry Creek at the Darling Way station, June 15 through August 31, 2001. Temperatures are not suitable for juvenile rearing.

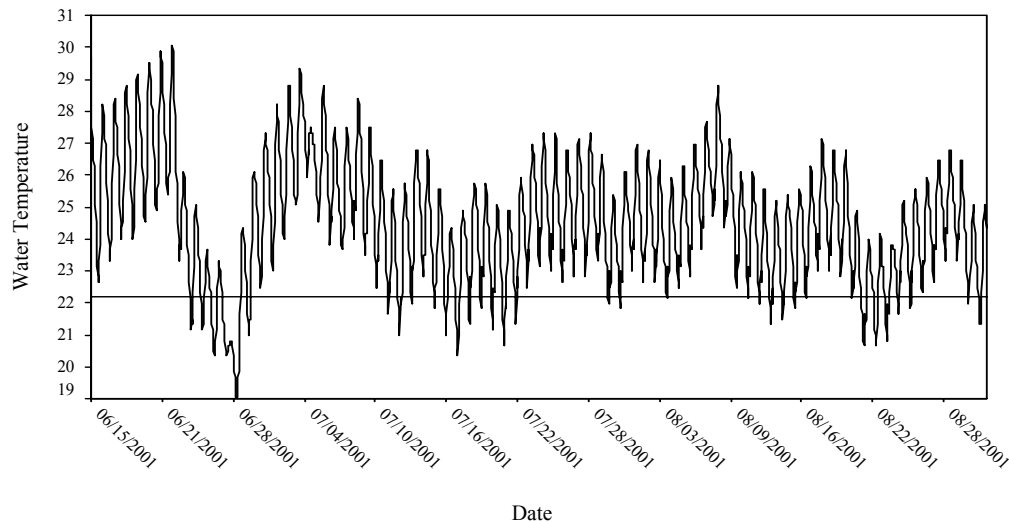


Figure 10. Water temperature time series for Dry Creek at the Darling Way station, September 1 through December 31, 2001. Temperatures become suitable for juvenile rearing in mid-September and adult spawning in late-October.

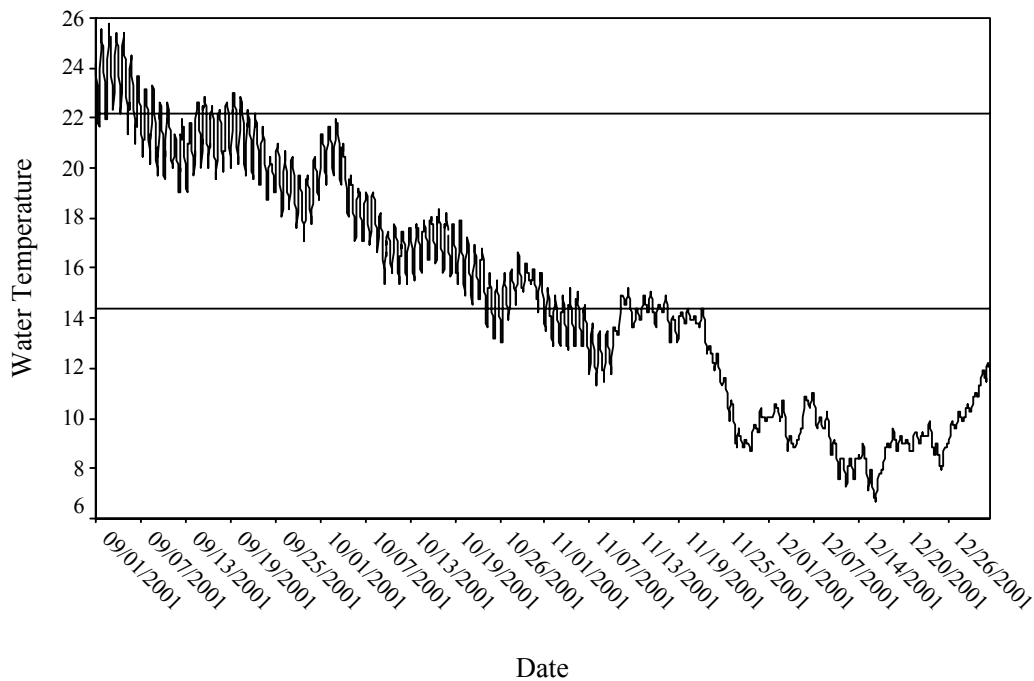


Figure 11. Water temperature time series for Dry Creek at the Darling Way station, January 1 through April 30, 2002. Temperatures are suitable for juvenile rearing throughout the entire period. Temperatures are suitable for incubation through about the end of March.

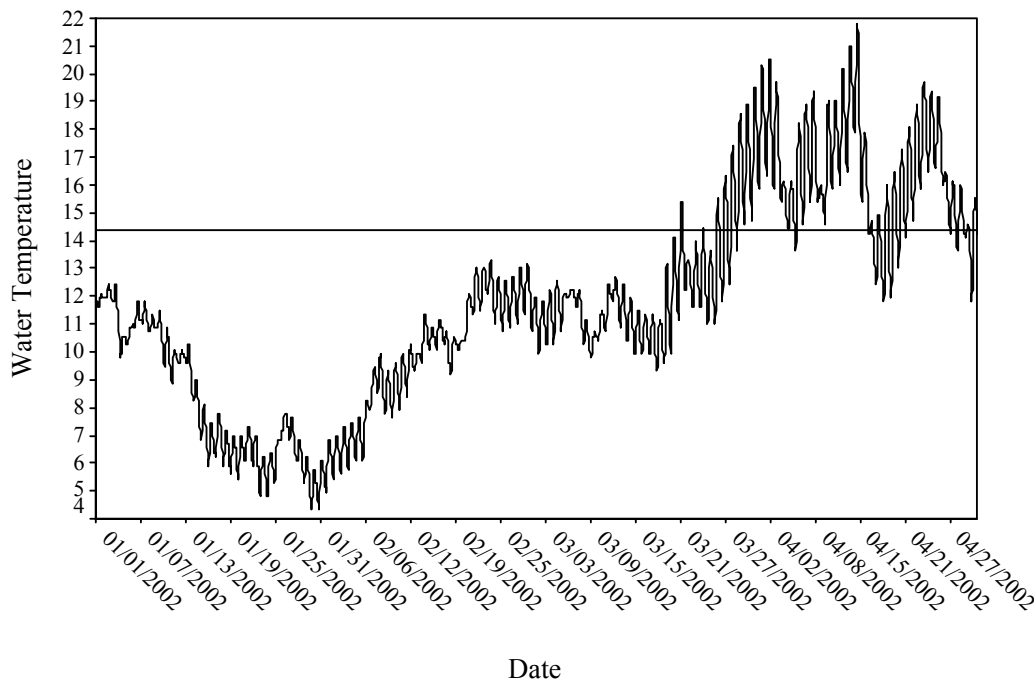


Figure 12. Water temperature time series, Dry Creek at the Darling Way station, May 1 through June 17, 2002. Temperatures are suitable for juvenile rearing for most of the period.

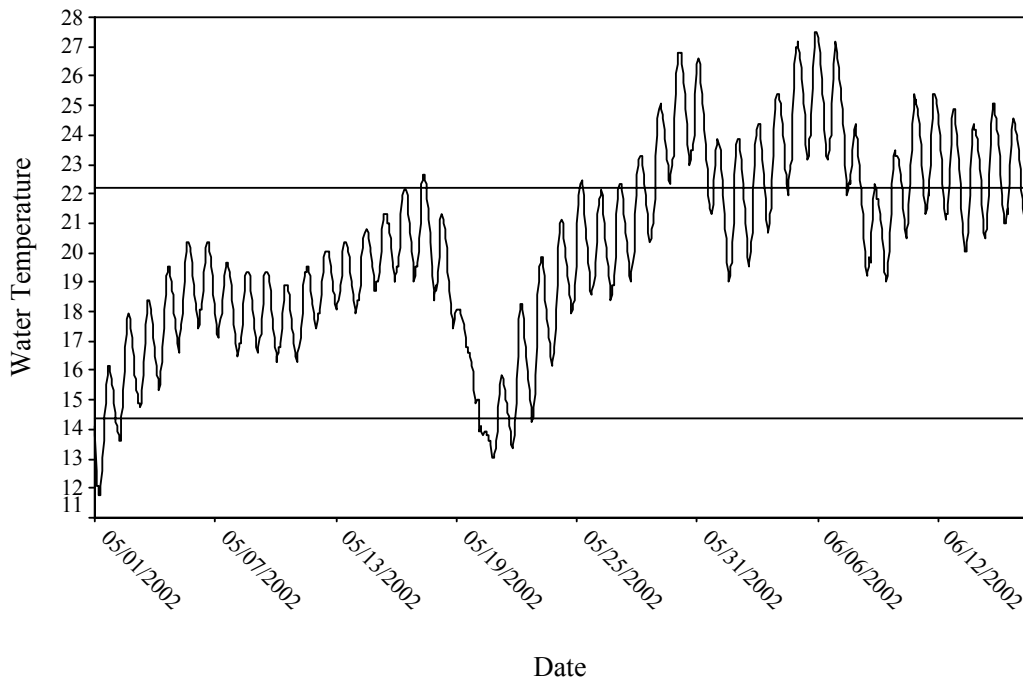


Figure 13. Water temperature time series for Dry Creek at the Riverside Drive station, during the period June 15 through August 31, 2001. Temperatures are not suitable for juvenile rearing.

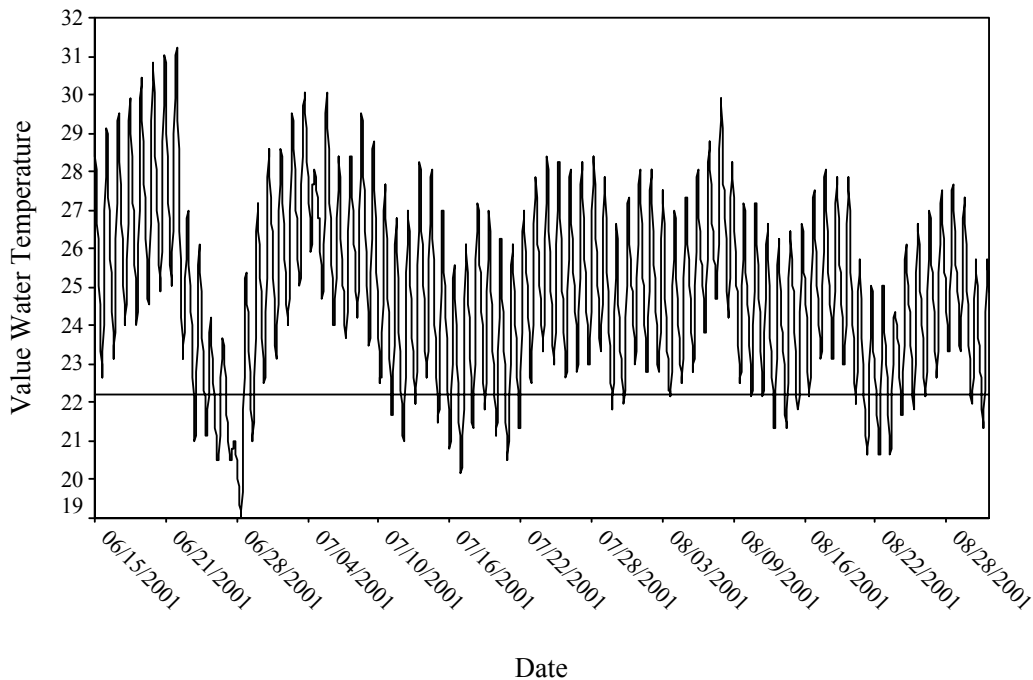


Figure 14. Water temperature time series, Dry Creek at the Riverside Drive station, September 1 through December 31, 2001. Temperatures become suitable for juvenile rearing in mid-September and adult spawning in late-October.

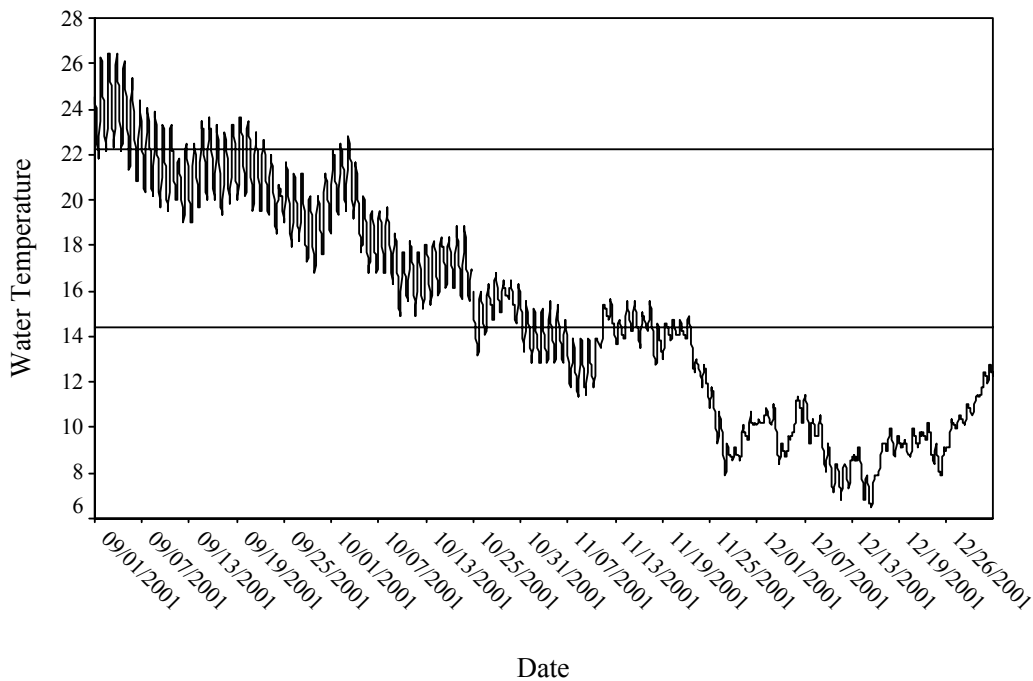


Figure 15. Water temperature time series, Dry Creek at the Riverside Drive station, January 1 through April 30, 2002. Temperatures are suitable for juvenile rearing throughout the entire period. Temperatures are suitable for incubation through about the end of March.

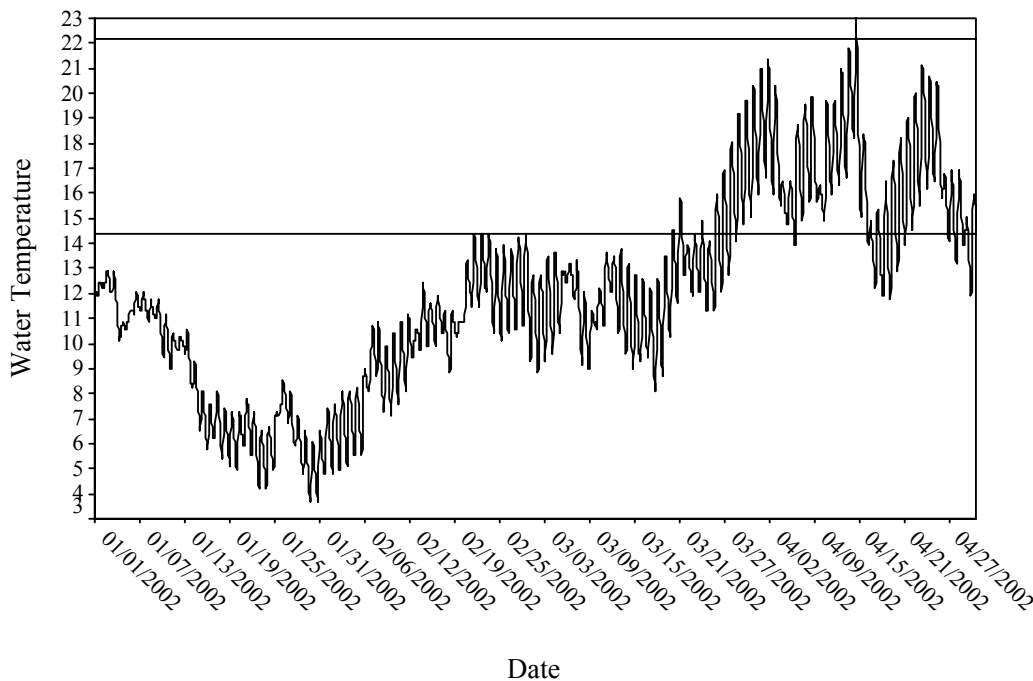
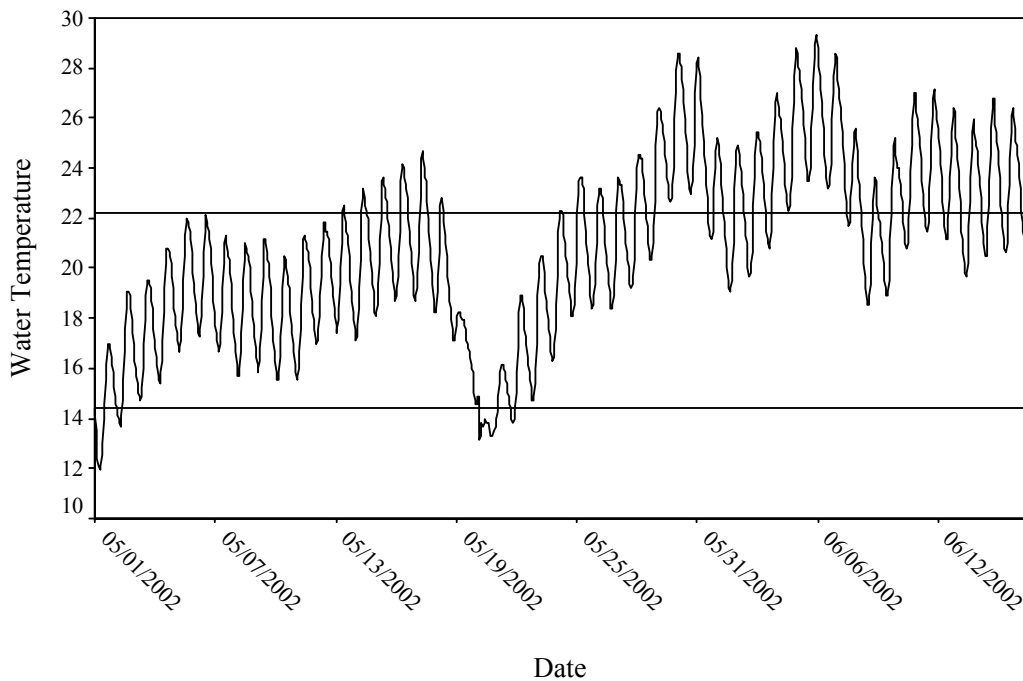


Figure 16. Water temperature time series, Dry Creek at the Riverside Drive station, May 1 through June 17, 2002. Temperatures are suitable for juvenile rearing throughout most of the period.



C. Benthic Invertebrate Data

Members of the Dry Creek Conservancy conduct the sampling program for benthic macroinvertebrates. Sampling data from 2000 at a single and unidentified site in Dry Creek and a sample collected at Royer Park in Roseville in 2001 are presented in Appendix Dry Creek 1. The data indicate a high percentage of pollution tolerant organisms, with almost no taxa that are associated with cleaner waters. These results are not unexpected given the urban nature of the stream and the amount of sediment deposited in the channel. **Source: Dry Creek Conservancy, unpublished data.**

D. Physical Habitat Data

Physical habitat data are limited to three sources for Dry Creek's mainstem:

1. **1992-1993 Habitat Inventory by David Vanicek, Professor at California State University, Sacramento:** The habitat inventory was limited to seven reaches [*An eighth reach has been added to Table 5 to cover the stream from the confluence with Antelope Creek to the split into Secret and Miners Ravine for consistency; Vanicek titled this reach Lower Miners Ravine.*]. Vanicek described and rated the habitat conditions (Table 5), and made a series of recommendations regarding improving fish habitat conditions for parts of Dry Creek, Antelope Creek, Secret Ravine, and Miners Ravine. The focus of the recommendations was on riparian vegetation, water flow, instream habitat complexity, increasing the number and size of pool habitats, and addressing impediments to anadromous fish passage (both beaver dams and man-made obstructions).

Vanicek defines flatwater as the same as would be considered a glide in most other methodologies. A 1st class pool is large and deep with more than 30% of the stream bottom obscured, etc., or a maximum depth of > 1.5m. A 3rd class pool is described as small in area or shallow or both. Depth and velocity are sufficient to provide a low velocity holding area for a few adult salmon. Overall habitat quality ratings range from 1 (poor) to 5 (excellent). **Source: Fisheries Habitat Evaluation Dry Creek, Antelope Creek, Secret Ravine, and Miners Ravine (Task I); Prepared for EIP Associates by C. David Vanicek, CSUS Hornet Foundation, August 1993, Copy from CDFG files, Region 2.**

Table 5. Reach, habitat descriptions, and quality assessment for Dry Creek from the Cook Riolo Rd. Bridge upstream to the confluence of Secret and Miners ravines.

Reach and Location	Reach Length (m)	General Conditions (Overall Quality: 1= poor; 5 = excellent)
DC-1a: Cook Riolo Rd. to Sewage Treatment Plant (STP)	1400	Mostly flatwater and shallow pools; a few deep pools (1 st class); substrate mostly sand and silt; cover poor to fair; stream volume is increased significantly here by discharge from STP; Overall quality: 2.
DC-1b: Lower STP boundary to upper STP boundary	700	Mostly flatwater, with a few 3 rd class pools; one 1 st class pool at sewage outfall; substrate mostly sand and silt; cover poor; Overall quality: 1.
DC-2: City limit west of Atkinson to SPRR tracks	750	Mostly flatwater, but with a few pools (2 nd and 3 rd class) and riffles; deep holding pool at base of SPRR cascade; substrate mostly sand and silt, but with some rubble areas. Cover poor to fair; Overall quality: 2.
DC-3: SPRR to Cirby Creek confluence	1100	Mostly flatwater; very few riffles; a few 2 nd and 3 rd class pools; mostly sand and silt substrate; cover poor, mostly provided by overhanging vegetation; on 1 st class pool at Cirby confluence; disturbed stream bed under SPRR (4 culverts) and Foothill Blvd. overpasses (absence of streamside cover); Overall quality: 1.
DC-4: Cirby Creek to Darling Way	300	Nearly all flatwater; a few 3 rd class pools; mostly sand and silt substrate; poor cover; dam at Cirby confluence is a barrier at low flows; Overall quality: 1.
DC-5: Darling Way to Douglas Blvd.	1150	More habitat diversity here than downstream; flatwater still predominate, but several pools (one 1 st class and several 2 nd and 3 rd class) and riffles; more rubble and gravel substrate than downstream, but sand/silt still most common type; cover fair, provided by pools, log, and overhanging vegetation; two possible low-water barriers: low dam in middle of reach and cascade at Douglas bridge; significant canopy; Overall quality: 3.
DC-6: Douglas	900	Some habitat diversity, but much of this reach is

Blvd. to Folsom Rd.		channelized; large pool (2 nd class) occupied by domestic waterfowl, presenting an organic pollution problem; a few riffles and pools (2 nd and 3 rd class); substrate mostly sand and silt, but several areas with rubble and gravel; cover fair; Overall quality: 2.
DC-7: Folsom Rd. to Antelope Creek confluence	1520	Fair habitat diversity; flatwater still predominates, but numerous riffles and pools (all 3 classes) present; substrate mostly sand and silt, but rubble and gravel common; fair to good cover provided by pools, in-stream structures and overhanging vegetation; two possible barriers at low flows: debris or rock dam at Lincoln Estates Park and persistent beaver dam just below Antelope Creek; Overall quality: 3.
LMR: Antelope Creek confluence to Secret Ravine confluence	1200	Good habitat diversity (in spite of stream disturbance caused by highway bridges); flatwater still very common, but riffles and pools comprising about 40% of reach; at least on 1 st class pool and several 2 nd and 3 rd class pools; gravel, rubble, and boulder comprise about 50% of substrate; good cover provided by pools, instream structures and overhanging vegetation; possible barriers at low flow: shallow riffle under I-80 bridge, and beaver dams; Overall quality: 4.

Source: Fisheries Habitat Evaluation Dry Creek, Antelope Creek, Secret Ravine, and Miners Ravine (Task I); Prepared for EIP Associates by C. David Vanicek, CSUS Hornet Foundation, August 1993, Copy from CDFG files, Region 2.

2. 2002 Foot Survey by Randy Bailey, Bailey Environmental: During November-December of 2002, I conducted foot surveys for spawning chinook salmon from the confluence of Cirby Creek upstream to the confluence with Secret Ravine. I also conducted foot surveys in February 2003 from Harding Blvd. upstream to Secret Ravine. The purpose of the surveys was to supplement surveys being conducted by the Dry Creek Conservancy.

During these surveys, the stream bottom was covered with an excessive load of sediment that appeared to be decomposed granite in origin. The stream was mostly within a confined channel and obviously has been channelized in a number of locations. The soil banks along the stream in this location were more dirt and clay, rather than granite. There was large woody debris in the channel throughout its length. Habitat complexity was good, consisting mostly of pool complexes, but the amount of sediment in the channel limits aquatic insect production in riffle areas. This area is mostly low gradient. Occupation of the area by beavers was observed and may continue to create a problem for anadromous fish passage. This survey generally confirmed Vanicek's findings. **Source: Bailey Environmental, unpublished data.**

3. 2003 Placer County Stream Videography Project: On March 12, 2003 this project shot videotape of Dry Creek from about the Placer County line upstream to the confluence of Secret and Miners ravines. Review of the VHS tape shows that the stream is still very similar to the description by Vanicek. The channel bottom is primarily sand and silt, with riffle areas

having a high sediment concentration. The stream appears to suffer from eutrophication problems and aquatic insect production is limited because of the high levels of sediment depositions in the riffle areas. The riparian vegetation appears to be in fair to poor condition. In many locations, the riparian vegetation is very narrow and signs of reproduction are lacking, particularly downstream of about Atkinson Street. The stream has been confined to a relatively narrow corridor and much of the bank protection is riprap. In some protected areas bank erosion is beginning to heal from earlier disturbances, but there are some areas where bank erosion is contributing large amounts of sediment to the channel. Although there are some anecdotal reports of salmon spawning near Folsom Rd. in downtown Roseville, most of this channel should be considered as a migratory corridor. **Source: 2003 Placer County Stream Videography Project, unpublished data.**

E. Fishery Resource Data

1. Documented Fish Species Present in the Stream

This section documents only those fish species captured in a portion of the mainstem of Dry Creek. However, any of the fish species documented in the major tributaries to Dry Creek could contribute other fish species to the list presented below and all of the species should be considered as part of the Dry Creek fish fauna.

Sacramento sucker	Pacific lamprey
Hitch	Spotted bass
Golden shiner	Green sunfish
Bluegill	Smallmouth bass
Black bullhead	Largemouth bass
Carp	Tule perch
Fall-run chinook salmon (native)	
Fall-run chinook salmon (hatchery origin introductions)	
Sacramento pikeminnow (formerly known as Sacramento squawfish)	

Source: California Department of Fish and Game, Region 2 files; Fisheries Habitat Evaluation Dry Creek, Antelope Creek, Secret Ravine, and Miners Ravine (Task I); Prepared for EIP Associates by C. David Vanicek, CSUS Horner Foundation, August 1993; 1999 Scientific Collecting Permit records from Garcia and Associates (from CDFG files).

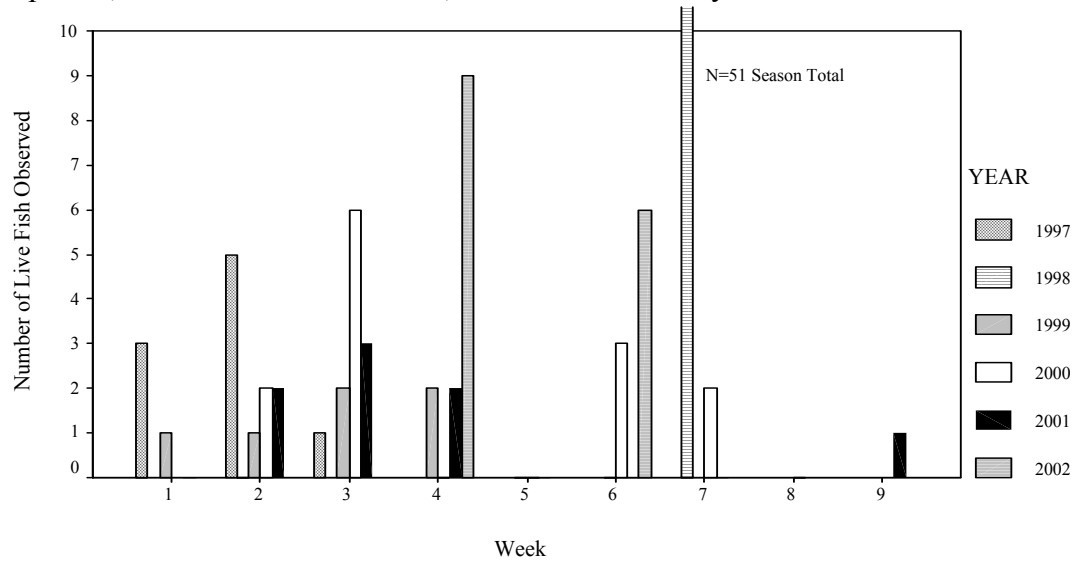
2. Fish Stocking Records

Only a single record of fish stocking was found in Department of Fish and Game files for Dry Creek. The record indicates that on 2/17/93, 100,190 fall-run chinook salmon fry from Nimbus Fish Hatchery, weighing 1,165 fish/lb. (36 mm mean length) were stocked at the Southern Pacific Railroad Yard in Roseville. Although this is the only record for Dry Creek, other stockings in Secret and Miners ravines will be documented in the report for those streams separately.

3. Adult Spawning Timing, Distribution, and Population Estimates

- **1992 Spawning Surveys by Dave Vanicek:** Vanicek and his crew conducted foot surveys of selected sections of stream from October 28 to December 29, 1992. During these surveys, the crew concentrated on the deeper pools (holding water) and the entire stretch of reaches DC-3 and DC-4 (see a description of the reaches in the physical habitat section of this report and Table 1 and Figures 2a and 2b in the original Vanicek report). They saw only three live salmon; two in reach DC-4 (plus one carcass) on December 3rd and a third fish in Secret Ravine on January 3, 1993. Four other carcasses were seen in Secret and Miners ravines later in the season. Anecdotal information reported by Vanicek indicated that the salmon run was small in 1992, probably because of rainfall occurring late in the year. **Source: Fisheries Habitat Evaluation Dry Creek, Antelope Creek, Secret Ravine, and Miners Ravine (Task I); Prepared for EIP Associates by C. David Vanicek, CSUS Hornet Foundation, August 1993.**
- **1993 Fall-run Chinook Salmon Spawning Survey by the California Department of Fish and Game:** On 11/24/93, the Department conducted a foot survey from Miners Ravine downstream to Royer Park in Roseville. The survey covered approximately 1 mile of stream north of the Roseville Automall with no fish or redds observed. One female was observed on a redd adjacent to Royer Park. A park employee reported one male salmon. **Source: Unknown author memorandum in CDFG, Region 2 files.**
- **Summary of Dry Creek Conservancy Fall-run Chinook Salmon Surveys in Dry Creek:** Dry Creek Conservancy members have been conducting foot surveys during the fall and early winter since 1997 (Figure 17). The reach surveyed is described as being from Harding Blvd. to a point about 400 yards downstream. Surveys usually begin about November 1 and continue until late December. Surveys are not systematic or comprehensive for the stream, with only a single section surveyed each year and not consistently from week to week throughout the spawning period, although the number of surveys has generally increased in recent years. Dry Creek does have some documented spawning areas that are not surveyed by this effort, but may serve mainly as a migration corridor to upstream spawning areas in Secret and Miners ravines and Antelope Creek. The lack of a comprehensive and systematic survey protocol may not be much of an issue, because the majority of fish passing through Dry Creek may be using the creek as a migration corridor to another spawning area and may pass through this reach in a matter of hours, often in darkness, and therefore may not be detected. However, the magnitude and timing of fish spawning in Dry Creek upstream of the confluence with Cirby Creek cannot be estimated at this time. **Source: Dry Creek Conservancy; unpublished data.**

Figure 17. Summary of fall-run chinook salmon sampling surveys, with number of live fish reported, from 1997 to 2002 in a 1,200 ft. section of Dry Creek in Roseville.



4. Juvenile Distribution and Sampling Data

- March 1972 One-time Electrofishing Event:** The Department of Fish and Game conducted a one-time electrofishing event on March 30, 1972 at a location described as in the park and zoo area [I conclude this is Royer Park and Zoo area], with no length of stream sampled given. Catch composition is reported as: 1- golden shiner, 1- hitch, and 2-green sunfish. Flow was reported as high. **Source: Unsigned, unidentifiable author note in CDFG, Region 2 files.**
- August 7, 1992 Electrofishing by Dave Vanicek:** Vanicek and crew electrofished three areas in Dry Creek on August 7, 1992 and recorded the catch shown in Table 6, below. No sampling distance is reported. **Source: Fisheries Habitat Evaluation Dry Creek, Antelope Creek, Secret Ravine, and Miners Ravine (Task I); Prepared for EIP Associates by C. David Vanicek, CSUS Hornet Foundation, August 1993.**

Table 6. Number of fish captured in an August 7, 1992 electrofishing survey at three locations in Dry Creek in Roseville.

Species	Saugstедt Park	Lincoln Estes Park	Eureka Road
Pacific lamprey	--	1	4
Sacramento squawfish [pikeminnow]	1	--	1
Hitch	2	--	--
Sacramento sucker	4	--	--
Bluegill	--	--	2
Green sunfish	--	--	1
Spotted bass	7	9	6

Source: Fisheries Habitat Evaluation Dry Creek, Antelope Creek, Secret Ravine, and Miners Ravine (Task I); Prepared for EIP Associates by C. David Vanicek, CSUS Hornet Foundation, August 1993.

- 1999 Sampling at the Atkinson Street Bridge by Garcia and Associates for the City of Roseville:** The City of Roseville commissioned sampling and water temperature monitoring in connection with the Cirby-Linda-Dry Creek Flood Control Project. Although most monitoring effort was in the Cirby and Linda Creek watersheds, data from the 1999 collection permit for Garcia and Associates contained information for sampling conducted at the Atkinson St. Bridge. Data are summarized on Table 7, but the juvenile anadromous fish captured could have come from Cirby-Linda or Secret-Miners ravines. Information on Table 7 is included only to demonstrate juvenile salmon emigration timing and further document fish species composition in Dry Creek. **Source: 1999 Scientific Collecting Permit records from Garcia and Associates (CDFG files).**

Table 7. Summary of fish sampling conducted on four dates in 1999 at the Atkinson Street Bridge in Roseville.

Species	4/27/99	5/6/99	5/21/99	5/28/99
Chinook salmon	20	21	5	--
Sacramento pikeminnow	7	5	3	7
Sacramento sucker	5	11	10	7
Bluegill	2	--	1	1
Green sunfish	5	4	3	2
Smallmouth bass	4	1	4	3
Spotted bass	6	8	2	4
Hitch	--	15	--	--
Pacific lamprey	--	--	--	1

Source: 1999 Scientific Collecting Permit records from Garcia and Associates (CDFG files).

- May 2002 Electrofishing Effort by John Nelson, CDFG, Region 2:** Nelson conducted several sampling efforts in April and May of 2002, based on a citizen inquiry about northern pike presence in Dry Creek. Department staff visually surveyed a 400 m reach near the Cook Riolo Rd. Bridge on April 22. On May 3, electrofishing was conducted at the Cook Riolo Rd. Bridge and at a location approximately 400 m upstream. Sections sampled were approximately 150 m. On May 29th, an additional 150 m section was sampled near the Atkinson Street Bridge in Roseville. Combined sampling results are presented in Table 8. **Source: July 10, 2002 Memorandum from John Nelson, Department of Fish and Game; Region 2 files.**

Table 8. Combined electrofishing results from sampling conducted near the Cook Riolo Rd. Bridge and Atkinson Street Bridge in May of 2002.

Species	5/3/2002	5/29/2002
Sacramento pikeminnow	10	--
Largemouth bass	4	5
Sacramento sucker	5	4
Smallmouth bass	2	2
Green sunfish	1	1
Chinook salmon	1	0

Source: July 10, 2002 Memorandum from John Nelson, Department of Fish and Game; Region 2 files.

F. Fish Passage or Screening Data

Vanicek's report discusses man-made structures and natural barriers in the context of what was known about salmon and steelhead distribution in 1993. For example, Vanicek does not recommend any beaver dam removal upstream of the fourth bike path crossing on Miners Ravine because he believed that steelhead would not be present in the Dry Creek Watershed.

Subsequent sampling by the Department of Fish and Game (Rob Titus) has demonstrated that steelhead do occur in the watershed. Vanicek's main concern was the large number of beaver dams present in the system, certain riffles and low rock dams that might be barriers at low flows, and the pipeline crossing at the confluence with Cirby Creek near Riverside Drive. Anadromous fish routinely migrate into the watershed to spawn. However, the key to ensuring population stability is to allow full access on an annual basis. Access to spawning areas should not be subject to the limitations of low flows and/or partial or complete barriers, whether man-made or natural. Vanicek expresses concerns about the fish ladder at the Southern Pacific Railroad Yard and the number of apparently persistent beaver dams in the watershed. However, Vanicek's inventory is over 10 years old, and there may have been significant changes in the overall situation since then. The pipeline crossing at the Cirby Creek confluence is still a problem, but conditions may have changed over the decade. A new survey of all potential barrier problems should be completed before any conclusions are drawn. The recent Department of Water Resources habitat and barrier inventory on Miners Ravine could be used as a partial template for a new evaluation.

APPENDIX DRY CREEK 1

BENTHIC MACROINVERTEBRATE DATA COLLECTED BY THE DRY CREEK CONSERVANCY

Dry Creek Benthic Macroinvertebrate Samples 2000 - 2001																	
								Dry Creek				Dry Creek @ Royer Park					
SAMPLING STATION:								2000				2001					
REPLICATE #								TV	FF G	54	55	56	Total	64	65	66	Total
PHYLUM ARTHROPODA																	
Class Insecta																	
<u>Coleoptera (Larvae)</u>																	
Elmidae								4	c								
<i>Dubiraphia sp.</i>								6	c								
<i>Microcylloepus sp.</i>								4	c								
<u>Diptera</u>																	
Ceratopogonidae								6	p								
<i>Bezzia sp./ Palpomyia sp.</i>								6	p								
<i>Dasyhelea sp. (pupa)</i>								6	nf								
Chironomidae								6									
Chironominae																	
Chironomini								6	c								
Pseudochironomini								5	c						1	1	
Tanytarsini								6	c	31	25	29	85	74	34	63	171
Orthocladiinae								5	c	63	42	31	136	29	17	33	79
Tanypodinae								7	p							1	1
Empididae								6	p								
<i>Clinocera sp.</i>								6	p								
<i>Hemerodromia sp.</i>								6	p								
<i>Neoplasta sp.</i>								6	p								
Muscidae								6	p								
<i>Limnophora sp.</i>								6	p								
Simuliidae								6	f								
<i>Simulium sp.</i>								6	f	13	10	28	51	5	10	4	19
Tipulidae								3									
<i>Limonia sp.</i>								6	s								
<u>Hemiptera</u>																	
Corixidae								8	p								
<i>Sigara sp.</i>								8	p								
<u>Megaloptera</u>																	
Sialidae								4	p								
<i>Sialis sp.</i>								4	p								
<u>Odonata</u>																	
Calopterygidae								5	p								

						<i>Nectopsyche gracilis</i>	3	c											
						<i>Trienodes/Ylodes sp.</i>	6	s											
						Philopotamidae	3	f											
						<i>Chimarra sp.</i>	4	f											
						<i>Wormaldia sp.</i>	3	f											
						Subphylum Chelicerata													
						Class Arachnoidea													
						<u>Acari</u>													
						Hygrobatidae	8	p											
						<i>Hygrobates sp.</i>	8	p					4			3		7	
						<i>Megapella sp.</i>	8	p											
						Lebertiidae	8	p											
						<i>Lebertia sp.</i>	8	p	2	5	4	11			2			2	
						Sperchontidae	8	p											
						<i>Sperchon sp.</i>	8	p	6	9	9	24	1		2		6		9
						Torrenticolidae	5	p											
						<i>Torrenticola sp.</i>	5	p											
						Subphylum Crustacea													
						Class Malacostraca													
						<u>Amphipoda</u>													
						Cragonyctidae	4	c											
						<i>Crangonyx sp.</i>	4	c				2	2						
						<i>Stygobromus sp.</i>	4	c											
						Hyaellidae	8	c											
						<i>Hyaella sp.</i>	8	c											
						<u>Decapoda</u>													
						Astacidae	8	c											
						<i>Pacifasticus lenisculus</i>	6	c								1		1	
						Class Ostracoda													
						<u>Ostracoda</u>	8	c											
						Cyprididae	8	c											
						PHYLUM COELENTERATA													
						Class Hydrozoa													
						<u>Hydrozoa</u>													
						Hyridae													
						<i>Hydra sp.</i>	5	p											
						PHYLUM MOLLUSCA													
						Class Gastropoda													
						<u>Pulmonata</u>													
						Ancylidae	6	g											
						<i>Ferrissia sp.</i>	6	g	1			2	3						
						Lymnaeidae	6	g											

